UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,535	07/25/2003	Tatsuro Uchida	03560.003334.	1160

5514 7590 04/19/2005

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
SONG, SARAH U	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/626,535	UCHIDA, TATSURO	
	Examiner	Art Unit	
	Sarah Song	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7,9-13 and 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7,9-13 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's communication filed on February 2, 2005 has been carefully considered and placed of record in the file. Claims 1, 3, 5, 9 and 15 have been amended. Claims 6, 8 and 14 have been canceled. Claims 1-5, 7, 9-13 and 15 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

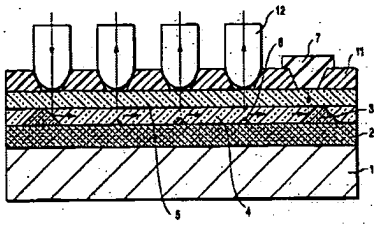
> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1-5, 7 and 9-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Furuyama (U.S. Patent 2004/0151462).**

4. Regarding claim 1, Furuyama discloses an optical waveguide apparatus comprising:

- a sheet-shaped optical waveguide capable of propagating light in two-dimensional directions;
- a light transmitting unit 12 for transmitting light through said waveguide;
- a light receiving unit 12 for receiving light transmitted through said waveguide; and
- relaying means 6 for relaying light transmitted from said light transmitting unit and propagating in said waveguide at a place between said light transmitting unit and said light receiving unit to transmit the relayed light to said light receiving unit, wherein said relaying means includes a light diffusing structure comprised of a plurality of protrusions in said waveguide. See Figure 12.

5. Regarding claim 2, said relaying means is constructed such that a propagation condition (e.g. direction) of light propagating in said waveguide can be changed at a place on a light propagation path between said light transmitting unit and said light receiving unit in a relaying manner.



6. Regarding claim 3, said relaying means includes a structure capable of diffusing a light beam toward directions of a predetermined angular range in said waveguide (see arrows).

7. Regarding claim 4, said structure of the relaying means has a thickness less than a thickness of a core layer of said waveguide (see Figure 12).

8. Regarding claim 5, said relaying means includes a reflective structure capable of changing a propagation direction of a light beam propagating in the form of a beam while maintaining the beam form (see Paragraph [0095]).

9. Regarding claim 7, said relaying means includes a structure capable of changing a propagation condition (e.g. direction) of light propagating in said waveguide without processing light in a regenerative manner by amplification and shaping.

10. Regarding claim 9, said waveguide has a structure in which a sheet-shaped core layer 4 is sandwiched by a first cladding layer 2 and a second cladding layer 5.

11. Regarding claim 10, at least one of a light emitting device 12 in said light transmitting unit and a light receiving device 12 in said light receiving unit is arranged on a surface of said waveguide (see Figure 12).

12. Regarding claim 11, the optical waveguide apparatus further comprises an optical-path converting structure 3 for converting at least one light beam emitted from said light emitting

device into at least one light beam propagating in at least one predetermined direction, said optical-path converting structure being arranged in a portion of said waveguide below said light emitting device.

13. Regarding claim 12, said optical-path converting structure 3 has a spherical, hemispherical, conical, wedge-shaped, or polygonal pyramid-shaped structure (see Figures 12 and 14).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. **Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furuyama.**

16. Regarding claim 13, Furuyama does not expressly disclose a single VCSEL or an arrayed-type VCSEL.

17. VCSELs or arrayed-type VCSELs are well known in the art as compact light emitting devices.

18. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a VCSEL as an optical source since applicant has not disclosed that the particular type of light emitting device solves any stated problem or is for any particular purpose.

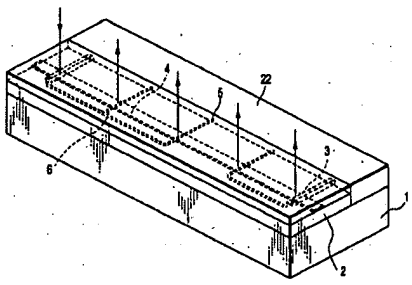
19. Furthermore, one of ordinary skill in the art would have been motivated to provide a VCSEL as the light emitting device in order to provide a compact planar structure thereby maintaining the planarity of the device of Furuyama.

20. **Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furuyama in view of Ouchi (U.S. Patent 6,477,286).**

21. Regarding claim 15, Furuyama discloses an opto-electronic hybrid circuit board for combining transmission of an optical signal and transmission of an electrical signal in a hybrid manner, said apparatus comprising:

- an optical waveguide apparatus, said optical waveguide apparatus including a sheet-shaped optical waveguide 2/4/5 capable of propagating light in two-dimensional directions, and relaying means 6 for relaying light transmitted from a light transmitting unit and propagating in said waveguide at a place between a light transmitting unit and a light receiving unit to transmit the relayed light to a light receiving unit; and
- an electronic circuit layer 22, said electronic circuit layer being electrically connected to said optical waveguide apparatus (see Paragraph [00153] and Figure 19).

It is noted that the relaying means includes a light diffusing structure comprised of a plurality of protrusions in said waveguide. See Figure 19.



22. Furuyama does not expressly disclose a light transmitting unit for transmitting light through said waveguide, a light receiving unit for receiving light transmitted through said waveguide in the embodiment shown

in Figure 19.

23. Furuyama also does not expressly disclose wherein part or all of signals in said electronic circuit layer is distributed by transmission and reception of the optical signal using said optical waveguide apparatus to operate electronic equipment.

24. Ouchi discloses a light transmitting unit (e.g. 9), a light receiving unit (e.g. 8), and wherein part or all of signals in said electronic circuit layer is distributed by transmission and reception of the optical signal using said optical waveguide apparatus to operate electronic equipment (see Abstract).

25. Furuyama and Ouchi are analogous art as pertaining to integrated circuits.

26. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the light transmitting unit (e.g. 9), a light receiving unit (e.g. 8), and the functionality of wherein part or all of signals in said electronic circuit layer is distributed by transmission and reception of the optical signal using said optical waveguide apparatus to operate electronic equipment of Ouchi in the device of Furuyama.

27. One of ordinary skill in the art would have been motivated to provide the above modifications in order to provide a compact multifunctional integrated structure having reduced cost as taught by Ouchi (see column 3, lines 8-12).

Response to Arguments

28. Applicant's arguments filed February 2, 2005 have been fully considered but they are not persuasive. Applicant states that Furuyama does not disclose a sheet-shaped optical waveguide and consequently fails to suggest relaying means including a light diffusing structure comprised of a plurality of protrusions formed in a sheet-shaped waveguide. Examiner respectfully

disagrees. A sheet can be defined as a broad stretch or surface of something or a portion of something that is thin in comparison to its length and breadth. Thus "sheet-shaped" could mean anything that exhibits the shape of a sheet. The waveguide shown by Furuyama is believed to meet the definition of a sheet on at least two levels. The core itself can be considered sheet-shaped since it is a broad stretch of a core material and also thin in comparison to its length and breadth a shown in the Figures of Furuyama. Furthermore, the waveguide (including the core and cladding) also meets the definition of sheet-shaped since it is a broad stretch of a waveguiding material and also thin in comparison to its length and breadth. Additionally, Furuyama clearly shows a relaying means comprising a light diffusing structure (structure that directs light in a plurality of directions) comprised of a plurality of protrusions 6 formed in the sheet-shaped waveguide. Therefore applicant's arguments are not persuasive.

29. The objections to the claims and the drawings made in the previous Office Action are withdrawn in view of the amendments.

Conclusion

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sarah Song
sus

John D. Lee
John D. Lee
Primary Examiner